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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO. <i>T-P</i>
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EXAMINER

ART UNIT	PAPER NUMBER <i>12</i>
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DATE MAILED:

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No. 1-14Applicant(s) Robert A. ...Examiner John L. ...Group Art Unit 1-14

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE THIRTY MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

Responsive to communication(s) filed on 08/14/1999

This action is **FINAL**.

Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- ☒ Claim(s) 1-14 is/are pending in the application.
- Of the above claim(s) 1-5 and 11-14 is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☒ Claim(s) 1-10 is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☐ Claim(s) _____ are subject to restriction or election requirement.

Application Papers

See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

The proposed drawing correction, filed on _____ is approved disapproved.

The drawing(s) filed on _____ is/are objected to by the Examiner.

The specification is objected to by the Examiner.

The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☒ All Some* None of the CERTIFIED copies of the priority documents have been received.

received in Application No. (Series Code/Serial Number) _____

received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

Attachment(s)

- ☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 1-2 Interview Summary, PTO-413
- ☒ Notice of Reference(s) Cited, PTO-892 ☐ Notice of Informal Patent Application, PTO-152
- ☒ Notice of Draftsperson's Patent Drawing Review, PTO-948 ☐ Other _____

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Part III DETAILED ACTION

Restriction

1. Restriction is required in the following inventions as required under 35 U.S.C. 121:

Group I. Claims 1-8, drawn to an apparatus for producing castings with directional and single crystal structure, classified in Class 104, subclass 34-1.

Group II. Claims 9-10, drawn to a method for producing castings with directional and single crystal structure, classified in Class 104, subclass 1-1.

Group III. Claims 11-14, drawn to an article with directional and single crystal structure, classified in Class 104, subclass 104.

2. The inventions are distinct, each from the other because of the following reasons:

Inventions Group I and Group II are related as an apparatus and apparatus for its practice. The inventions are distinct in that it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or system, or (2) the apparatus as claimed can be used to practice another

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and materially different process. MPEP 2103.1. In this case the process as claimed can be practiced by another materially different apparatus such as a reactor vessel with an inert gas cooling chamber.

Inventions Group II and Group III are related as process and making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process. MPEP 2103.1. In the instant case the product as claimed can be made by another and materially different process such as precipitation with a cooling.

Inventions Group I and Group III are related as apparatus and product made. The inventions in this relationship are distinct if either or both of the following can be shown: (1) that the apparatus as claimed is not an obvious apparatus for making the product and the apparatus can be used for making a different product or (2) that the product as claimed can be made by another and materially different apparatus. MPEP 2103.1. In this case the product as claimed can be made by another and

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materially different apparatus such as a casting machine for an inert gas cooling machine.

3. Because these inventions are distinct for the reasons given above and have required a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with Mr. Roy L. Mason on December 17, 1961 a provisional election was made without traverse to prosecute the invention of Group II, claims 1-11. Affirmation of this election was made by applicant in responding to this Office action. Claims 1-7 and 11-14 are withdrawn from further consideration by the examiner, 35 CFR 1.142 b, as being drawn to a non-elected invention.

5. Applicant is reminded that upon the determination of appeal to a non-elected invention, the inventorship must be amended in compliance with 35 CFR 1.49 b. If the name of the currently named inventor is not listed as inventor of at least one claim remaining in the application, any amendment of inventorship must be accompanied by a diligently-filed

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petition under 35 CFR 1.44(b) and the law required under
35 CFR 1.17(b).

6. Claims 4-10 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 4, line 1, "furnace relative to a heater" is unclear because "relative to" is unclear; lines 4-7, "at a predetermined" is not quantitatively definite; last line, where does the material come from? Further, "the water-cooled walls" lacks antecedent basis.

103 rejection

7. The following is a quotation of 35 U.S.C. § 103, which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained in the United States for any invention if it is obvious to one having ordinary skill in the art to which the invention pertains from the prior art consisting of references or knowledge available to the person skilled in the art at the time the invention was made. 35 U.S.C. § 103.

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4. This application is currently named "but" invention. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(a) and prior art under 35 U.S.C. 102(a) in a prior art under 35 U.S.C. 103(a).

5. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over XP 111,479 (a EP 1,111,479) in view of US 5,133,338 and further in view of Salkeld & Smith et al. XP 1790 (see abstractor EP 1672). Fig. 1 teaches the claimed method of producing castings with microalloy and stable crystal structure, comprising: placing a mold in a furnace; turning on a heater 1; preheating the mold to a temperature about 100 to 150 °C (100 to 160 °F), see col. 1, line 18 in EP 1,111,479; above the liquidus temperature of a casting alloy; lowering the heated mold having a thin casting alloy placed in

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the mold from a heating zone and into a cooling zone represented by cooling molten metal in a tank. Liquid metal is drawn out at a controlled rate (speed). XP '341 or EP '341 fails to teach radiation cooling of removing the radiation heat emitted from the mold surface to a tank surface without any use of conducting or convecting liquid metal in the cooling zone. However, EP '338 teaches radiation cooling for the purpose of effectively directionally solidifying the molten alloy without drawing crack in the mold.

In view of the prior art as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide XP '399 or EP '400 with radiation cooling method as taught by EP '338 even though liquid metal is required in the tank in the cooling zone so that the radiation emitted from the heated mold surface is transmitted away by the tank surfaces in order to effectively directionally solidify the molten alloy without drawing crack in the mold. Insofar as combined, XP '399 or EP '400 in view of EP '338 fails to teach the use of water-cooled means for the tank surface without any liquid metal. However, Salkeld et al. teaches the use of water-cooled means and a barrier between the heating zone and the cooling zone. See Salkeld et al.

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30 and a baffle 34 in Salkeld's Fig. 1 is a water-cooled means for removing heat from the tank surface and a baffle 36 in Doriath et al Fig. 1 is a means for effectively removing heat from the tank surface.

In view of the prior art as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to further provide XP 1000 with a baffle in view of JP '338 with a water-cooled means as taught by Salkeld and Doriath et al in order to effectively remove radiation heat from the tank surface and directionally solidify the molten alloy without drawing crack in the mold, which contains radiation heat from the molten metal in the solidification.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner I.-H. Lin whose telephone number is 202-295-1441.

Any inquiry of a general nature or relating to the status of this application should be directed to the Primary Examiner whose telephone number is 202-295-1441.

I.-H. Lin / H.

October 3, 1977

[Signature]
HAROLD PYON
SUPERVISORY PATENT EXAMINER

1022

10/10/77